

I CLAIM:

1. A threadedly engageable coupling device for use in a threadedly
engaging tightening assembly which includes a complementary
coupling device provided with a complementary threaded surface,
5 and which is used for tightening first and second article pieces
together, the first and second article pieces respectively
having first tightened and abutment wall surfaces and second
tightened and abutment wall surfaces opposite to each other, the
first article piece being made from a material of a first hardness,
10 and having a tubular bore that extends through the first abutment
and tightened wall surfaces, said threadedly engageable coupling
device comprising:

an abutment head having an abutment wall which extends in
radial directions, and which has a central area and an abutment
15 peripheral area surrounding said central area;

a cylindrical shank which extends from said central area along
an axis, and which has a first outer diameter that is smaller
than a caliber of the tubular bore, said cylindrical shank
including proximate and distal segments relative to said central
20 area, and a middle segment that is interposed between said
proximate and distal segments, and that forms a juncture with
said proximate segment, said distal segment having a primary
threaded surface which is adapted to mesh with the complementary
threaded surface, and being adapted to be moved relative to the
25 complementary coupling device along the axis by a friction force
that is generated through screwing movement of said primary
threaded surface relative to the complementary threaded surface;

and

a plurality of blade portions which are disposed on said proximate segment, and which are angularly displaced from one another about the axis, each of said blade portions being made from a material of a second hardness that is greater than the first hardness, each of said blade portions extending from said proximate segment radially and outwardly, and terminating at a cutting edge, said cutting edge being configured to gradually deviate from said proximate segment as said cutting edge extends from said juncture towards said abutment wall such that when said cylindrical shank is inserted into the tubular bore from the first tightened wall surface to permit said abutment wall to be brought to abut against the first tightened wall surface by the friction force, said cutting edge incrementally incises the first article piece along the axis towards the first abutment wall surface so as to guard against rotation of said cylindrical shank relative to the first article piece during the screwing movement, thereby tightening the first and second article pieces together.

2.A threadedly engageable coupling device according to Claim 1, wherein said blade portions are integrally formed with said cylindrical shank.

3.A threadedly engageable coupling device according to Claim 2, wherein said blade portions and said cylindrical shank are formed by punching a cylindrical blank body, said cylindrical blank body including a proximate segment blank which has an inner annular blank portion that is substantially of the same shape and dimension as said proximate segment, and an outer annular blank

portion that surrounds said inner annular blank portion about the axis, said outer annular blank portion having a second outer diameter that is slightly smaller than the caliber of the tubular bore, and that is larger than the first outer diameter so as to form an annular shoulder in proximity to said juncture.

4. A threadedly engageable coupling device according to Claim 3, wherein said annular shoulder is configured to converge from said proximate segment towards said middle segment along a direction parallel to the axis so as to ease the incremental incision of said cutting edge into the first article piece.

5. A threadedly engageable coupling device according to Claim 4, further comprising a plurality of block regions which are angularly displaced from one another about the axis, and which are alternately positioned with corresponding ones of said blade portions, said block regions being formed by keeping a plurality of corresponding areas of said outer annular blank portion intact when said outer annular blank portion is punched to form said blade portions.

6. A threadedly engageable coupling device according to Claim 5, wherein each of said block regions is dimensioned such that when said abutment wall is brought to abut against the first tightened wall surface, said block regions are brought to abut against the first article piece in the tubular bore.

7. A threadedly engaging tightening assembly used for tightening first and second article pieces together, the first and second article pieces respectively having first tightened and abutment wall surfaces and second tightened and abutment wall surfaces

opposite to each other, the first article piece being made from a material of a first hardness, and having a tubular bore that extends through the first abutment and tightened wall surfaces, said threadedly engaging tightening assembly comprising:

5 a complementary coupling device provided with a complementary threaded surface; and

a threadedly engageable coupling device including:

an abutment head having an abutment wall which extends in radial directions, and which has a central area and an abutment peripheral area surrounding said central area,

10 a cylindrical shank which extends from said central area along an axis, and which has an outer diameter that is smaller than a caliber of the tubular bore, said cylindrical shank including proximate and distal segments relative to said central area, and a middle segment that is interposed between said proximate and distal segments, and that forms a juncture with said proximate segment, said distal segment having a primary threaded surface which is disposed to mesh with said complementary threaded surface, and being moved relative to said complementary coupling device along the axis by a friction force generated through screwing movement of said primary threaded surface relative to said complementary threaded surface, and

20 a plurality of blade portions which are disposed on said proximate segment, and which are angularly displaced from one another about the axis, each of said blade portions being made from a material of a second hardness that is

25

greater than the first hardness, each of said blade portions extending from said proximate segment radially and outwardly, and terminating at a cutting edge, said cutting edge being configured to gradually deviate from said proximate segment as said cutting edge extends from said juncture towards said abutment wall such that when said cylindrical shank is inserted into the tubular bore from the first tightened wall surface to permit said abutment wall to be brought to abut against the first tightened wall surface by the friction force, said cutting edge incrementally incises the first article piece along the axis towards the first abutment wall surface so as to guard against rotation of said cylindrical shank relative to the first article piece during the screwing movement, thereby tightening the first and second article pieces together.

8. A threadedly engaging tightening assembly according to Claim 7, wherein said cylindrical shank has an inner tubular wall which extends along the axis and through said distal segment, and which has an inner threaded tubular surface to serve as said primary threaded surface, said cylindrical shank extending from said central area such that said distal segment is in the tubular bore when said abutment wall is brought to abut against the first tightened wall surface, and wherein

said complementary coupling device is configured to be a bolt which includes a bolt stem that is configured to extend through the second article piece and into said inner tubular wall, and that has an outer threaded surface to serve as said complementary

threaded surface, and a bolt head that is connected to said bolt stem and that is adapted to abut against the second tightened wall surface when the first and second article pieces are tightened together.

- 5 9. A threadedly engaging tightening assembly according to Claim 7,
wherein when said cylindrical shank is inserted into the tubular
bore from the first tightened wall surface, said middle segment
is adapted to extend through the second article piece so as to
10 permit said distal segment to extend outwardly of the second
tightened wall surface of the second article piece, said distal
segment having an outer surrounding wall which surrounds the axis,
and which has an outer annular threaded surface to serve as said
primary threaded surface, said complementary coupling device
15 being configured to be a nut which has an inner annular threaded
surface to serve as said complementary threaded surface.